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213. Proposed by W. J. GREENSTREET, M. A., Marling School, Stroud, England.

Two unequal, uniform, smoothly hinged rods are placed over a smooth vertical circle. Apply the principle of vertical work to find the condition of equilibrium in terms of the length of each rod, the diameter of the circle and the angle of either rod with the vertical.

NUMBER THEORY AND DIOPHANTINE ANALYSIS.

151. Proposed by E. B. ESCOTT, Ann Arbor, Mich.

In the recurring series, $n=0, 1, 2, 3, 4, 5, 6, 7, \dots$

$$u_n = 3, 0, 2, 3, 2, 5, 5, 7, \dots$$

where the scale of relation is $u_{n+3} = u_{n+1} + u_n$, prove that u_p is always divisible by p when p is prime. Is the converse true?

AVERAGE AND PROBABILITY.

193. Proposed by J. EDWARD SANDERS, Reinersville, Ohio.

What is the average area of all squares that may be inscribed in a given sector of a circle, a diagonal of the square being parallel to a random line across the sector?

194. Proposed by PROF. R. D. CARMICHAEL, Anniston, Ala.

What is the mean value of the triangle formed by joining three points taken at random on the circumference of a circle?

MISCELLANEOUS.

176. Proposed by WM. E. HEAL, Coffeyville, Kansas.

In Grassman's *Extensive Algebra*, $e_1 e_2 = -e_2 e_1$. If $e_1 = e_2$, $e_1^2 = -e_1^2 = 0$. In quaternions, $ij = -ji$, $i^2 j = i \cdot ij = ik = -j$, $i^2 = -1$. Reconcile these apparently divergent results.

NOTES AND NEWS.

The next Summer meeting of the American Mathematical Society will be held at the University of Illinois during September.

On December 17th occurred the death of Lord Kelvin, one of the greatest mathematicians and physicists of the present age.

On the 7th of November, 1907, occurred the death of Professor J. R. Rand, Professor of Mathematics in Bates College, Lewiston, Me. His successor is George E. Ramsdell.